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MOVABLE-REMOVABLE BRIDGEWORK

BY

HERMAN E. S. CHAYES, D. D. S.

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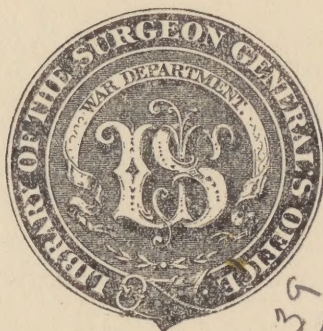


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MOVABLE-REMOVABLE BRIDGEWORK

WITH

A detailed, illustrated technique for the construction of a unilateral, compound
Movable-Removable Bridge

AND

A description of the instruments and
attachments employed.

BY

HERMAN E. S. CHAYES, D.D.S.

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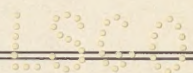
AUTHOR OF

The Cast Gold and Porcelain Inlay, the Problem of the Lower
Extension Bridge and Its Rational Solution. Empiricism
in Bridgework. Bridgework Conducive to Health, and
the Instruments with Which to Construct It. Endro-
crocenodontia. The Functions of the Teeth,
Etc., Etc.

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DEDICATED TO THE DENTAL PROFESSION



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A Word of Appreciation

THE author desires to express his appreciation for the earnest efforts of Mr. S. O. Cherpín, of the Chayes System, in the preparation of the models illustrated in this volume, and to assure the entire staff of the Chayes System of his appreciation of their loyalty to an ideal, without which the promulgation of a principle would have been woefully impeded and the progress of dentistry in no small measure retarded.

INTRODUCTION



IN offering this little book on the technique of Chayes Movable-Removable Bridgework to the dental profession, it will not be amiss to briefly refer to some of the salient periods in its evolution, so that they who attempt to, and succeed in doing this work, may have some rational and truthful basis for any correct reference they may be called upon to make.

Thus, in the matter of adjudication as to the right of priority, any sincere and well-informed dental practitioner will recall that up to the year of 1903 there were just about three methods of supplying missing teeth.

We had the so-called fixed bridge method, the partial plate method, and the well-known Peso method of bridgework. Between the years of 1901 and 1903 the Morgan attachment for partial dentures began to claim the attention of the dental profession.

In the year of 1904 the writer began the use of an original attachment in the construction of Cantilever bridges. It was a device of his own invention, and while it answered all the mechanical requirements in the cases where it was used, its impediment to function, seeking expression in a biologic way, were too many to be overlooked. Two years elapsed before the writer publicly showed this device at a clinic held in the old Terrace Garden, in New York.

The work created so favorable an impression that the originator was asked to clinic on the subject at the next national meeting, to take place in Jamestown, Virginia, in 1907.

In 1908 the writer read a paper before the Central Dental Association of Northern New Jersey, the subject being "The Problem of the Lower Extension Bridge and Its Rational Solution."

This paper was published in the Items of Interest in 1908, and was the first attempt on the part of any dentist to introduce the principles of dynamics as an important factor in the

construction of dental substitutes. For the first time in the history of dentistry it was made evident that the principles of biology which governed function of normal tissue in organs at work could not be violated without seriously impairing the vitality of the organs involved, and for the first time the writer then and there elucidated his now well-known warning against the inhibition or augmentation of the essential independent mobility of individual teeth in their particular orbit of motion.

In 1910 the author published his organon, an original contribution, entitled "Empiricism in Bridgework." In the same periodical he attempted to prove to the clear-thinking men in the profession that our restorative work had been crude and wholly immature in conception and execution, and considering the anatomical, physiological, and hygienic requirements of the human mouth, was anything but conducive to the health of the patient.

The writer believes that only the fact that Dr. Hunter, of England, published his now memorable paper on Oral Sepsis due to so-called modern dentistry almost simultaneously, saved him from greater wrath and condemnation by those members of the profession who, in their inertia, were quite pleased with conditions as they were.

Between the years of 1906 and 1912 the writer developed a set of paralleling instruments designed for use with the Peso split pin, and an attachment known as the mesio-distal attachment which was a modification of the one used in his lower extension cases. In February, 1912, he cliniced before the Illinois State Dental Society, at its meeting held in Chicago, and demonstrated this set of instruments as well as these attachments in their application to removable bridgework.

Not satisfied that the problem had been solved, he proceeded with his experiments, and in the year of 1915 showed for the first time an attachment he had evolved which he called the Bucco-Lingual attachment, so named because its position in the tooth which acted as the pier for a bridge was in a bucco-lingual direction. The paralleling instrument was refined, the parallelodrill was added, mandrels suitable for the various sizes of bucco-lingual attachments were devised, the technique for the construction of movable-removable bridge-

work was laboriously and very minutely worked out, and in the year of 1915 the author published his article on "Bridgework Conducive to Health and the Instruments with Which to Construct It." Items of Interest, November, 1915.

Through the years of 1911 and 1913 Dr. Chayes sought the aid of manufacturers to exploit his idea and bring it in all its possibilities and utility to his confreres.

The invariable answer was "Establish Its Reputation and Demonstrate Its Commercial Value." In 1914 he, with the aid of some of his patients, at a great expense, began the manufacture of the present instruments and attachments and to market them to the profession.

In 1916 these appliances were withdrawn from the general market, because the author felt that the results obtained by the men who were using them showed a mis-conception of the principles involved, and could not help but be destructive to the patient. A system of instruction was then carefully worked out, men were trained for the purpose of teaching, and no instruments were distributed except to such as had taken this course of instruction, under one of the instructors.

The work grew in desirability as the number of practical cases increased and as the understanding of the principles enunciated by the author came to be fully appreciated.

Ever alert to the possibility of reaping an unearned harvest, a number of manufacturers began to carefully offer to the profession inferior and unsuitable instruments and attachments, and even went so far as to copy and quote extracts from the author's writings, names of attachments, etc., in their attempt to exploit the intellect and labor of one whom a few years ago they had derided and whose inventions they had lustily ridiculed.

The writer believes that their efforts will be in vain. The profession is fully alive to their purpose and to the absolute inadequacy of the wares they offer; no dentist can expect to construct a real serviceable, honest movable-removable bridge except he use the instruments and attachments invented and designed by Dr. Chayes, and follow in every detail the minute technique as taught by him and his instructors.

With the growth of this work and with the development of a better knowledge of the cast gold inlay, it has become possible to make these instruments and attachments available to the profession at large. Any dentist desiring to do this work may obtain every assistance possible and reasonable from the Doctor in New York or at his clinic—also in New York.

Any man who has done this work for any great length of time and feels himself possessed of the necessary ability to guide others will be glad to act as a guide to anyone of his conferees, should he be approached for assistance.

THE CHAYES SYSTEM

SIMPLICITY is the soul of truth. Truth is that cosmic quality which results from the definite and logical interplay of mathematical concomitants as essentially contained first in cosmos and ultimately expressed in creation.

We have Ideation, Perception, Conception, Concentration, Meditation, resulting finally in physical action and ultimately Ideation, Concentration, become Manifestation on the terrestrial plane or we have the thought, then the act, then the finished product, which combines the thought and the Act. There are always the three things—always a triumvirate. Truth is therefore a component, a result and must be capable of satisfactory demonstration in two ways. Synthetically and analytically. We must be able to start with the primary or cornerstone idea and step by step synthesize our subject so that there shall be a sequential mathematical concordance between all parts. There shall be no gap and nothing left to speculation and we must be able to take the finished product and deduct from its working expression the reasons why and the manner in which all these concomitants affect one another, interplay with one another, and finally produce a resultant “TRUTH.”

The Chayes System of Movable-Removable Bridgework is capable of such synthesis and analysis which has been and can be demonstrated. It is the truth among all present systems of dental restorations and simplicity is its soul. The following mathematico, genetic concomitants enter into its end expression.

First: That the blood is ourselves in solution.

Second: That it carries to all parts of the body all the nutrient material necessary for the maintenance of life.

Third: That the ability of any organ to abstract from the blood stream its essential nutriment depends upon neural efficiency which is a definite rate of vibratory action, induced by cosmic energy in the particular instrument or organ.

From the understanding of the foregoing evolved the realization:

First: That the teeth sit in a resilient socket and move or are moved during function.

Second: That normal blood supply is essential for the maintenance of a normal resilient socket.

Third: That a normal blood supply can be maintained only by definite intermittent pressure.

Fourth: That in a normal mouth the intermittent pressure is supplied by the movements of the roots of the teeth in their sockets during mastication.

Fifth: That in any dental restoration a saddle must supply this intermittent pressure.

Sixth: That this can only be accomplished when a Movable-Removable Bridge is constructed, employing perfectly parallel bucco-lingual attachments, the male portions of which have been converted into definite arcs which become tangent to the perfectly straight lines of the bucco-lingual jackets housed in inlays cemented into the natural teeth which act as piers or abutments.

Roots may be used as abutments in which instance crowns are built upon the roots and the jackets are used within these crowns. See the technique of cast base crowns. Let it be understood that the author assumes an adequate knowledge on the part of the student of the process of construction of the cast gold inlay and all its kindred divisions of operative dentistry such as cavity preparation, root canal technique, etc. The elucidation of a greater part of such technique does not fall within the scope of this little volume and will be found minutely described and profusely illustrated in the author's work on the "Cast Gold Inlay." Mosby and Company, St. Louis.

BRIDGEWORK

BRIDGEWORK is the art of supplying edentulous spaces with artificial teeth in such a manner as to definitely limit their vertical and lateral displacement by using some natural teeth or roots which are present, as piers or abutments. Bridgework is classified in accordance with the teeth involved, as simple, compound, complex and cantilever.

SIMPLE BRIDGE

A simple bridge is one where the artificial substitute and the piers are subjected to the same physical stress, that is, where the stress is exercised in the same direction. Example: supplying a second upper or lower molar, using the third and first molars as abutments.

COMPOUND BRIDGE

A compound bridge is one in which the artificial substitute by virtue of its position and acquired occlusal relation, is subjected to a stress different from that which works upon the abutments. Example: Supplying a lateral incisor upper or lower, using the cuspid and central as abutments; or supplying a second lower bicuspid using the first molar and first bicuspid as abutments.

COMPLEX BRIDGE

A complex bridge is one in which the artificial substitutes are subjected to a stress wholly foreign to the stress of the abutments, and where the abutments are situated upon opposite sides of the arch. Example: Supplying four anterior teeth using the cuspids as abutments or supplying the four incisors and the four bicuspid and first molars, using the cuspids and second molars as abutments or piers.

CANTILEVER BRIDGE

A Cantilever Bridge is one which is attached to natural abutments at one end only and depends upon the resilient mucosa for its major support. Combinations of complex and cantilever bridges may exist, such as cases presenting anterior abutments upon both sides of the arch and posterior abutments on one side only.

The practice of all bridgework must be subject to certain essentials, none of which may be overlooked without impairing the value of the fixture as an accessory to the health of the patient, and, broadly speaking, may be summed up as follows:

First: The mechanical essentials of a bridge are abutments, attachments, saddle, and artificial teeth.

Second: Macroscopic essentials of a bridge are the correct mesio-distal, bucco-lingual and gingivo-occlusal measurements of all the mechanical essentials.

Third: The surgical essentials of a bridge are the extirpation of the pulps when necessity for this operation exists; the correct cleaning out and filling of the root canals and the proper preparation of the pier teeth or the cavities within them.

Fourth: The physiological essentials of a bridge are the interplay of the surgical and mechanical essentials with the adjacent and subjacent tissue in such a manner as to facilitate the occurrence of intermittent pressure upon the subjacent resilient mucosa during mastication.

Fifth: The phonetic essentials of a bridge will be complied with when its form has been correctly produced, for only then will it play its part as a resonator, amplifier, and articulator of sound.

ABUTMENTS AND ATTACHMENTS

What has been said of bridgework as a whole applies, of course, to abutment and attachments in detail. Abutments may be broadly divided into posterior and

anterior. The sum total of anchorage, that is, the sum total of contact surface between abutments and surface of tooth or root must be at least one-third greater than that part of the abutment which is exposed to grinding or triturating stress.

ATTACHMENTS

Attachments are the intermediary agencies which link the artificial restoration known as bridgework to the abutment. They are made a fixed part of the bridge. Wherever possible, it is best to have the attachment form the male portion of an appliance, which will be completed when this portion is inserted into a corresponding female part existing in the abutment.

The one essential fact to remember in the construction of attachments is that they must definitely and frictionally engage whatever space exists for them in the abutments, any latero-rotary play being provided by an arc of sufficient curve to take into account the amount of soft tissue displacement during mastication.

If a box and friction plate be used, the box must be placed into the abutment and must run as nearly bucco-lingually as possible; its shape must be that of the rectangle; the friction plate attachment is joined to the bridge, and it is so filed gingivally that it presents an arc to which the perfectly straight floor of the gingival part of the box shall be tangent. The sides of the friction plates are filed in the same manner. Thus we produce three straight lines tangent to three arcs.

The attachments invented and advocated by the author are known as has been said before, as bucco-lingual attachments. There are at the present time, ten sizes to be used under different conditions, as graphically illustrated in the accompanying chart. There are certain precautions that must be observed in the use of these attachments so that one may obtain from them the greatest possible efficiency in the construction of a Chayes Movable-Removable Bridge.



CHART A

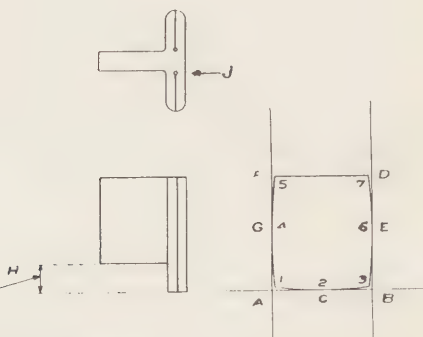
Illustration shows ten sizes of teeth with the attachments soldered into the inlays made for them and underneath each tooth is illustrated the male part of the attachment, the jacket of which has been soldered into the respective teeth. Carbons are here also illustrated. At the extreme end of this chart is seen the upright attachment soldered on to the cast base and beneath that may be seen the jacket as well as the carbon.

To begin with the student should be careful to so prepare his inlays in the teeth which are to act as abutments, that these attachments or rather the jackets of them may be placed within these inlays in as nearly as possible a bucco-lingual direction and in such a manner that the cross arm of the attachment will be in a position as nearly over the center of the alveolar ridge as possible. The slot in the jacket which engages the male part of the attachment should never be opened for its entire length and there should always be a part of the male portion of the attachment so housed within the jacket as to produce a variation of depth within the jacket between the cross arm and the friction plates.

No attachment should ever be tooled upon its flat surface for any reason whatever. Difficulty of insertion of the bridge when completed means a lack of parallelism and must be adjusted by finding the place of the error and applying the proper remedy. The lateral mobility in a bridge should be taken care of by arcing, the buccal-lingual and gingival sides of the attachments producing an arc on the three sides mentioned which must never be greater in extent than one-half of the thickness of the metal of which the frictional part of the attachment is made. Too great an arc provides for too great a lateral mobility of the bridge and consequently produces an overstimulation of the subjacent gingiva upon which the saddle rests. Failure to arc will induce a stasis on the same area and will finally produce a resorption of the alveolar process under the saddle. The correct degree of the arc will induce a constant intermittent pressure of correct inten-

sity which is essential to the maintenance of a normal blood supply upon which the life and integrity of the subjacent tissue depend.

TABLE OF DIMENSIONS OF CHAYES ATTACHMENTS
AND
DIAGRAM SHOWING MAXIMUM REDUCTIONS AND CURVATURES PERMISSIBLE



NOTE.—THIS EXTENSION MAY BE REDUCED
TO NOT LESS THAN $\frac{1}{3}$ OF ITS
ORIGINAL LENGTH

ATTACHMENT	THICKNESS	WIDTH	LENGTH
LARGE MOLAR	040"	210"	240"
SMALL MOLAR	030	180"	240
LARGE BICUSPID	035	150	225
SMALL BICUSPID	030	125	225
EXTRA HEAVY	045"	150	260"
STRAIGHT ANTERIOR	020"	100"	300"
CURVED ANTERIOR	015"	100"	300"
LARGE EXTRA THIN	025"	200"	240"
SMALL EXTRA THIN	020"	150"	225
DISTAL EXTENSION	058"	124"	250"

CHART B

TABLE OF DIMENSIONS OF CHAYES ATTACHMENTS

Diagram showing the maximum reductions permissible. Figure A, B, C shows the straight line of the attachment before it has been arced to arc 1, 2, 3. Line A, G, F shows the straight line of the attachment before it has been arced to arc 1, 4, 5, and line B, E, D, shows the straight line of the attachment before it has been converted into arc 3, 6, 7. At the point H note that this extension may be reduced to not less than one-third of its original length, and this means that the slot through the jacket must never be opened entirely, but that there must always remain a sufficient amount of depression in the jacket to take a corresponding extension on the attachment into its gingival housing. The arrow designated "J" shows the method provided in order to enhance the amount of play between the two plates of the attachments.

SADDLES

THE saddle is that part of a bridge which rests upon the mucosa and supports the artificial tooth or teeth.

The greater the area covered by the saddle, the more stable will be the support of the bridge under the stress of mastication.

The size and design of saddles must vary as the kind and number of artificial teeth supplied and as the condition of the underlying tissue.

Single anterior teeth may be supplied with a saddle no larger than the gingival circumference of the teeth themselves, provided that the artificial tooth is attached to parallel natural abutments by means of parallel attachments at its mesial and distal extremity.

The saddle as a means of relieving the stress upon abutments is a far more important factor in upper posterior bridges than in lower ones, because the mandible is the moving member of the masticating machine—or its power arm.

The ultimate shape of a saddle must be calculated not to encroach upon the gingival circumference of the teeth adjacent to the edentulous space.

A saddle should not be movable upon the mucous membrane, but should move with it. It may be correctly compared with a pontoon bridge moving with the tidal motion of the liquid upon which it rests.

The area of a saddle should equal the area of the roots of those teeth which are being replaced with the artificial ones carried on the saddle.

A saddle must be so shaped buccally and lingually that it will not encroach upon any of the muscles while at rest or in function. A saddle must be perfectly adapted to the subjacent tissue.

A properly cast saddle is more perfectly adapted to the subjacent tissue than one which is swedged.

The same amount of care, skill, labor and attention to detail will yield a better saddle by the casting process than by the swedging process.

The saddle should be as thin as the stress to which it will be subjected will permit, and it should never be of a bulk which would prove obtrusive to any of the surrounding and adjacent or subjacent tissues.

The muscles of mastication are the motor, the artificial teeth, resting upon the saddle, are the driving or vibrating shaft, and the saddle is the applicator which massages the subjacent mucosa and underlying structure when the artificial teeth are in function.

The more perfect the occlusion of the artificial teeth, the more rhythmic the periodicity of the intermittent pressure transmitted through the saddle intermediary to the saddle applicator, thence to the adjacent and subjacent living tissue, and the more perfect will be the vasomotor action of the nutrient vessels of these tissues.

All the foregoing is in harmony with the statement that a bridge is an artificial partial denture resting upon a floating base, its motion being aided to a degree and limited by parallel attachments constructed in accordance with the geometric concept of the arc being tangent to a straight line.

Again, teeth, natural teeth, our own teeth, move in the exercise of their function; they move in various directions, the degree and direction varying as the complexity of function being little and more or less simple for incisors and intense and multi-directional for trituration.

A saddle which is perfectly adapted to the underlying mucosa, and which cannot move while the teeth are in function, will always cause resorption.

A saddle which snaps into position by means of some clasp or clamp attached to it, and which after reaching its position is about as stable as a gate upon loose hinges, will always cause resorption.

A saddle which is perfectly adapted to the underlying mucosa, and which is held there against all lateral

displacement, will always cause a hyperemia and finally resorption.

A saddle which is perfectly adapted to the underlying mucosa and is held there against all vertical and lateral yield, will bring about a distinct pathological change in the underlying tissue, finally resulting in resorption.

The sequelæ of these pathological and tissue changes are systematically far-reaching in deleterious effect, and must be avoided by the following means:

A saddle must be perfectly adapted to the underlying mucosa, and it must be held in place by parallel attachments which engage parallel abutments, and which will allow a limited vertical bucco-lingual, a linguo-buccal, and to a very limited degree a mesio-distal yield.

The extent of vertical yield is determined by the elastic limit of the subjacent tissue upon which the saddle rests. A halt must be called before the limit of displacement has been reached.

The extent of the bucco-lingual and linguo-bucco yield is controlled by the degree of the arc created upon the attachments, and the degree of the arc is determined by the condition of the subjacent tissue being greater for soft and easily displaced tissue, and less for hard and unwillingly yielding membranes.

The mesio-distal yield is affected by having the attachments which hold the saddle in position consist of double metallic plates, elastic in action with a minute space between them.

A saddle perfectly adapted to the subjacent tissue and held in place with attachments as described will not cause any resorption, provided that subjacent tissue is organically efficient and without taint.

THE PLANNING, MOULDING AND CASTING OF SADDLES

An impression tray which is large enough to take in all the area desired and which will not strain the mouth is selected.

The area involved is freely bathed with a .001 ad-renalin solution.

The base plate waxed barrier is formed around the distal part of the tray, to prevent the flow of the impression material into the throat.

The impression tray is filled with a creamy mix of plaster, and with a broad spatula, the parts to be reproduced are covered with plaster.

The tray is carried into the mouth and gently brought into position to cover the parts.

If it is an upper impression, the tray is held in place with one hand, while the other extends the cheek and upper lip of the patient and brings it down taut over the plaster-covered buccal and labial margin of the tray.

If it is a lower impression, the tray need not be barriered against the flow of impression material and the other procedure is the same.

When the plaster has become sufficiently hard, the tray is removed and the impression is carefully taken out of the mouth in sections, or as one piece if no undercuts are present.

If the impression is in several sections, these are carefully assembled and waxed together in the tray.

The impression is now covered with a thin, separating fluid-shellac or thin colored sandrac varnish. When this has become dry it may be thoroughly soaked and the cast is made with a good hard plaster. It is helpful to surround the impression with a sheet of wax or paper so as to confine the model plaster, and it is best to insert the model plaster into the impression in small quantities with the aid of a small-sized badger hair brush until every part of the impression has been covered with a thin layer of the model plaster. Larger quantities may then be added until the required bulk is obtained, when the impression containing the model plaster is inverted upon a glass slab and left there until the cast is hard enough to be separated from the impression.

A satisfactory substitute for model plaster for saddle purposes has been found. The artificial stones at present obtainable are quite suitable for this purpose; their working qualities are reliable and the results quite satisfactory. When the cast is sufficiently hard it is carefully separated from the impression and trimmed to symmetrical form.

PLANNING THE SADDLE

With a soft pencil the shape and extent of the proposed saddle is marked off and two definite landmarks, such as gingival margins of adjacent teeth, or protuberances are included in the area.

A broad groove is cut into the model lingually and palatally or buccally and labially, as shown in Fig. 5. This groove begins about 2 mm. below the pencil marks and may be all of 3 mm. deep and 3 mm. wide.

The model is lubricated with a thin oil and a sheet of Platcheck wax, of suitable thickness and sufficient size, is softened in warm water, 110° F. and placed over the model.

A ball of absorbent cotton is dipped into the warm water, and with this the wax is gently but efficiently patted or swedged to place. If the case is very extensive the entire model should be kept warm by periodically inserting it in warm water.

When the adaptation is satisfactory the saddle is trimmed to outline as indicated by the visible pencil marks.

INVESTING SADDLE PATTERNS

The ideal way of investing patterns for saddles is to insert the sprue-wire in such a manner as will bring the sprue-hole and all the saddle area into one continuous line. Unfortunately, the range of our present casting machines and flasks is entirely too small to allow such procedure, so that we are forced most often to insert the sprue-wire at right angles to the saddle, and are thus compelled to cast into 360 undulating

radii of a circle; a difficult procedure, even under favorable circumstances.

When the sprue has been properly placed the wax is chilled with cold water, the refractory compound is mixed and with a small brush the entire area of wax is carefully covered with the mix, with which the groove upon the model is also filled to overflowing, so that the mix which covers the wax and the grooves will flow into one mass, which is gradually added to until a body of refractory compound from 2 to 3 mm. in thickness has been built up over the model and sprue-wire.

When crystallization has taken place, the surplus is carefully cleaned away until the margin of the wax saddle becomes visible all around.

The model is smartly tapped upon the bench several times and the saddle will be found to loosen; compressed air may be blown against the model at the margin of the saddle. Practice will facilitate this part of the technique.

The sprue is now inserted into the crucible former and another mix of refractory compound is made. When this is ready, the crucible former and partly invested saddle are held under the running cold water for a few moments, and the now exposed and as yet uninvested area of the saddle may be carefully covered with the refractory mix, which must join the first investment without giving up any part of its water, in crystallization.

When all of the saddle has been covered, the flask is placed over the crucible former and filled with a compound by pouring the latter in from the side until it rises to fill the flask. The crucible former is now held with two fingers of one hand while the two fingers of the other rotate the flask upon its seat on the crucible former back and forth several times to insure a homogeneous mass.

When crystallization has taken place the surplus is trimmed off, the crucible former is removed by rotating it to the right, the sprue-wire is heated by

holding the flask over a small Bunsen flame, the flaked compound is carefully dried under low heat. When steaming of the compound has ceased, the heat is raised the wax is thoroughly burnt out, the mould is allowed to cool, and the saddle is cast.

STRESSES IN MASTICATION

Incision, prehension, mastication or trituration are resultants of opposing forces as expressed in occlusal stresses of upper and lower teeth, or rather of lower against upper teeth. The direction in which these stresses are exercised vary in these functions so that it must be definitely understood, that the stress which actuates the anterior teeth to incision, is not the same as the one which actuates the cuspids to prehension and not the same which actuates the bicuspids in their prehenso-tritulating function, and that the stress which actuates the other teeth to their particular functions, is not the same either in intensity or direction.

The stress which resolves itself in incision is exercised in an upward, outward and backward direction, against the upper incisors and results in an opposing stress downward, inward and forward against the lower incisors, or gingivally and labio-distally in the upper incisors and gingivally and linguo-mesially in the lower incisors.

Upper cuspids are called upon to withstand a stress slightly upward, markedly outward and equally forward and backward, that is, gingivally and labio-mesio-distally.

This is balanced by the suspension ligament, the lips, the tongue and the adjoining teeth.

The lower cuspids resist a pressure downward, inward, forward and backward; that is gingivally and linguo-mesio-distally. This is balanced by the suspension ligament, the tongue, and the adjoining teeth.

The upper bicuspids yield to stress in an intra-alveolar, labio-distal and linguo-mesial, in an upward, outward and backward, and in an inward and forward

direction balanced by the suspension ligament, the cheeks, the tongue and the adjoining teeth. The lower bicuspid incur a stress markedly downward and inward to a less degree down and backward and in a down and forward direction, or mainly gingivally and lingually intra-alveolar and to a less degree intra-distally and intra-mesially.

The upper molars yield to a stress in an upward, outward, backward, inward and forward direction (outward and backward predominating) or in an intra-alveolar, bucco-distal, bucco-mesial and palato distal direction (bucco-distal predominating). Here we see what may be considered a rotary yield to stress or what is more, an almost spheroidal yield in the exercise of function, balanced by the suspension ligament, the cheeks, the fibres of the buccinator muscles, the tongue, the adjoining teeth and in the last upper molar by the tuberosity.

The lower molars yield to a functional stress in the following direction. Markedly gingivally, markedly intra-bucco-distally and intra-linguo-mesially; and in a less degree intra-disto-lingually and mesio-buccally, or markedly downward, and backward, down in and forward and in a less degree down, back and inward and down, forward and outward.

All the foregoing data regarding stress exercised upon teeth in function are for teeth in nearly normal occlusion and with any marked deviation from the normal must come a study of the individual case and the stresses which the teeth may be subjected to when in use.

For the reason that cases requiring restorations known as bridgework rarely if ever present normal occlusion, study models are absolutely essential to the man who undertakes the case. The architect who expects to build a shack, a bungalow, a cottage or a skyscraper has his plans to follow, all figured out to the minutest detail. The engineer who undertakes to build a railroad bed or a bridge knows to a bolt for

every fishplate or to a rivet in every joint just what he is to do. An unforeseen emergency arising, he is better prepared to meet it properly and successfully if he had studied his plans than he would be if he were doing his work in a haphazard empiricism. A bricklayer has his line to follow; a mason his straight-edge, a die maker and his depth-gauge are inseparable; a machinist and his blueprints or patterns are spoken of as one.

Study models should be the synonym for dentists, and those study models should be made from plaster impressions carefully taken. The casts or models should be carefully made of the hardest workable plastic substance obtainable, and these models should come in for a large share of the dentist's attention.

Each tooth should be carefully examined in the mouth and as carefully on the model. These models must be studied separately and in their relation to one another.

If but one tooth be missing and a restoration is to be undertaken, the care exercised in the examination of the model should be as equally thorough as if any number of teeth were involved.

CLASSIFICATION OF BRIDGES AMPLIFIED

A bridge which involves one side of the mouth is a unilateral simple, or a unilateral compound bridge.

A bridge which involves both sides of the mouth is a bilateral complex bridge; and it must be remembered that the teeth which are directly concerned in the construction or occlusion of a bridge, indirectly influence all the other teeth in the mouth to a more or less limited degree, either favorably when the work has been properly executed, or unfavorably when the restoration is faulty.

An artificial restoration such as a piece of bridge-work, can never be modified, or in any way influenced by its environment but on the contrary it may exercise a powerful influence upon any environment in which it may be placed.

If we now recall the definition of a simple bridge, we can readily see why it would be the least difficult one to so construct, that it would be wholly conducive to the health of the patient and the realization is inevitably brought home to us by the process of association of ideas that it would be desirable if there were no others, that is, if all were simple bridges.

Next to having no need for bridges at all, it would be ideal if we never had any but simple bridges to construct, and since we have bridges, we may as well exclude the first condition for the present and accept for our ideal that bridge in which the abutments and the artificial substitute are subjected to a stress in the same or very similar direction during the exercise of function.

Forthwith, we realize that this is an idea not possible to reach in a great many cases, particularly the extensive ones, and in seeking to approach our ideal as nearly as we may, we do the next best thing; we compromise by making the compound, complex, and cantilever bridge as simple as we can by releasing the abutments when stress of mastication is applied to the bridge. We can do this only by constructing a Chayes Movable-Removable bridge for the case and this can be accomplished only when we use the Chayes instruments and Chayes Bucco-Lingual attachments which were designed for this purpose.

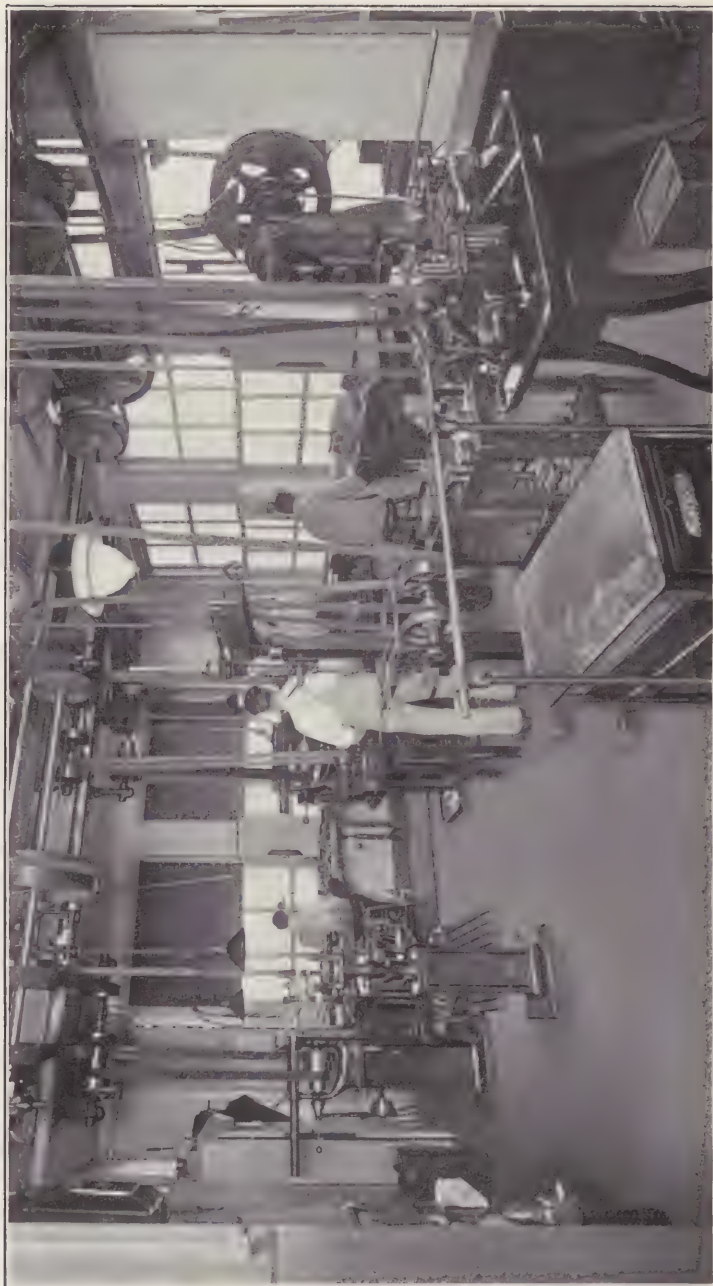


ILLUSTRATION OF PART OF THE MACHINE SHOP WHERE ALL APPLIANCES USED IN THE CONSTRUCTION OF CHAYES MOVABLE-REMOVABLE BRIDGEWORK ARE MADE



ILLUSTRATION OF ONE OF THE CLASS ROOMS IN THE CHAYES POST-GRADUATE SCHOOL.



ILLUSTRATION OF ANOTHER ROOM IN THE SAME SCHOOL.

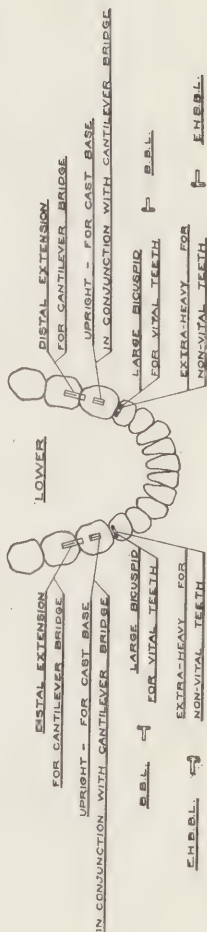
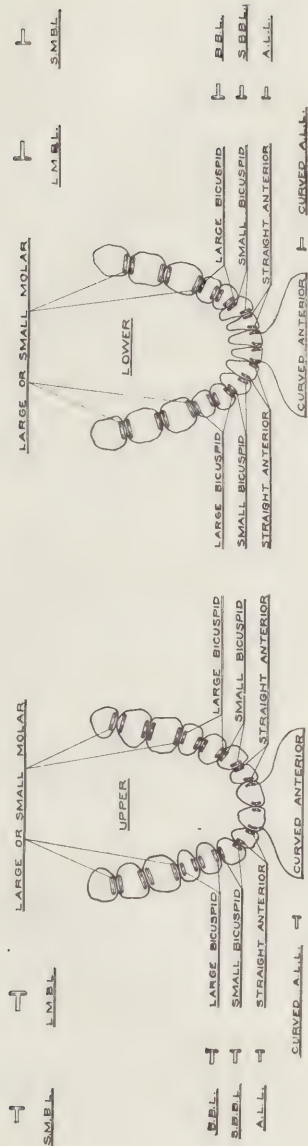
DIAGRAMATIC CHART

OF

UPPER AND LOWER JAW

SHOWING THE APPLICATION OF ALL SIZES OF

CHAVES ATTACHMENTS



A DIAGRAMMATIC CHART OF AN UPPER AND LOWER JAW SHOWING THE USE OF THE VARIOUS ATTACHMENTS AND THE TEETH IN WHICH THEY MAY BE USED. IT IS ADVISABLE TO EXAMINE THIS CHART UNDER THE MAGNIFYING GLASS IN ORDER NOT TO STRAIN ONE'S EYES DURING THE EXAMINATION. THE SIZE OF THIS LITTLE VOLUME DID NOT PERMIT THE MAKING OF A LARGER CHART.

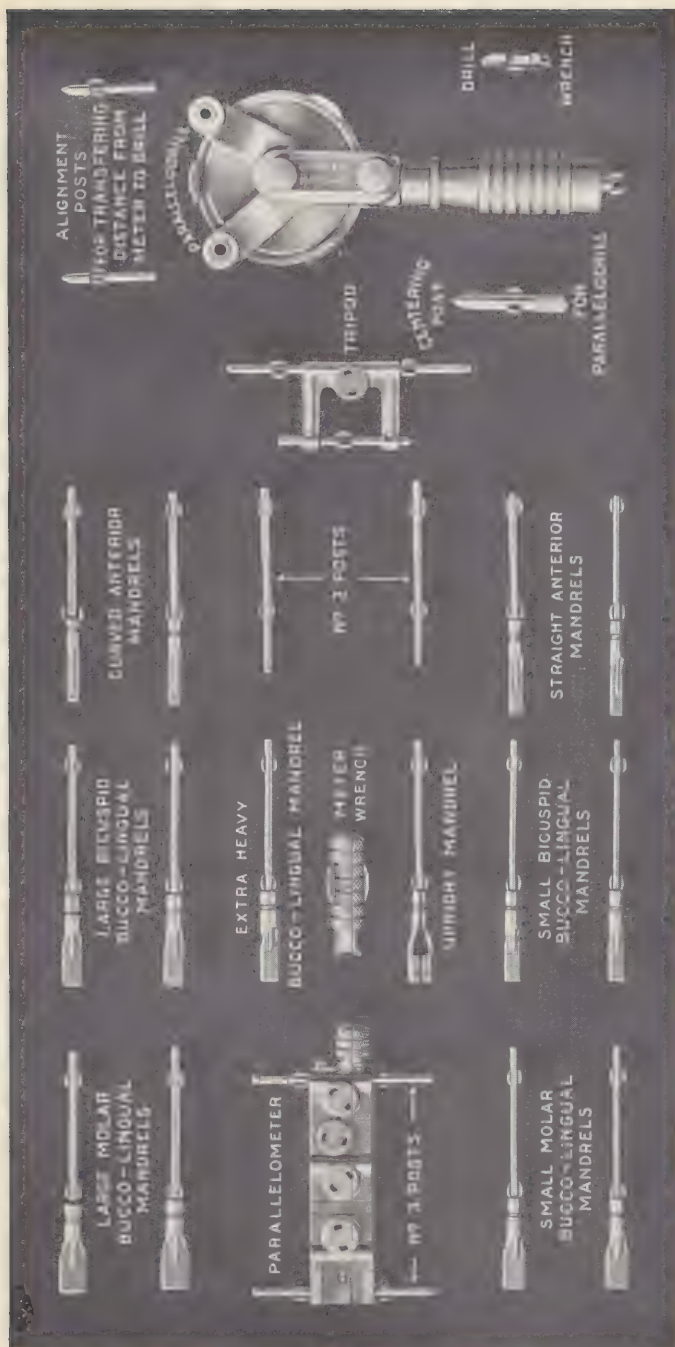
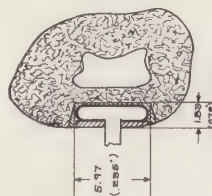


ILLUSTRATION OF THE PARALLELOMETER, PARALLELODRILL AND ALL THE VARIOUS BUCCO-LINGUAL MANDRELS AND OTHER ACCESSORIES USED IN CHAYES BRIDGEWORK.

CHART ILLUSTRATING AMOUNT
OF TOOTH STRUCTURE REMOVED
WHEN USING THE VARIOUS SIZES
OF CHAYES ATTACHMENTS.



UPPER FIRST MOLAR
CROSS SECTION THROUGH PULP CHAMBER
WITH CHAYES ATTACHMENTS IN PLACE



LOWER FIRST MOLAR
CROSS SECTION THROUGH PULP CHAMBER
WITH CHAYES ATTACHMENTS IN PLACE

NOTE—OVER-ALL DIMENSIONS OF CHAYES ATTACHMENTS GIVEN IN TABLES INCLUDES JACKET-REINFORCING PLATE, AND INLAY-DIMENSIONS ARE GIVEN IN MILLIMETERS AND UNDERNEATH IN PARENTHESES, THE EQUIVALENTS IN THOUSANDTHS OF AN INCH.

UPPER TEETH				LOWER TEETH			
MEASUREMENTS OF THE TEETH OF MAN GIVEN IN MILLIMETERS AND TENTHS OF MILLIMETERS. AND UNDERNEATH IN PAREN- THESIS, THE EQUIVALENTS IN HUNDREDTHS OF AN INCH.				MEASUREMENTS OF THE TEETH OF MAN GIVEN IN MILLIMETERS AND TENTHS OF MILLIMETERS. AND UNDERNEATH IN PAREN- THESIS, THE EQUIVALENTS IN HUNDREDTHS OF AN INCH.			
MESIO-DISTAL DIAMETER OF CROWN	MESIO-DISTAL DIAMETER OF NECK	LABIO-OR BUCCAL DIAMETER	OVER-ALL DIMEN- SIONS OF CHAYES ATTACHMENTS	MESIO-DISTAL DIAMETER OF CROWN	MESIO-DISTAL DIAMETER OF NECK	LABIO-OR BUCCAL DIAMETER	OVER-ALL DIMEN- SIONS OF CHAYES ATTACHMENTS
AFTER BLACK				AFTER BLACK			
AVERAGE	9.0	6.3	7.0	AVERAGE	5.4	3.0	5.4
GREATEST	(.39)	(.24)	(.27)	GREATEST	(.23)	(.12)	(.23)
LEAST	(.27)	(.19)	(.21)	LEAST	(.09)	(.05)	(.09)
CENTRAL INCISOR				CENTRAL INCISOR			
AVERAGE	8.0	5.6	7.0	AVERAGE	6.0	5.0	6.0
GREATEST	(.31)	(.21)	(.27)	GREATEST	(.23)	(.19)	(.23)
LEAST	(.21)	(.15)	(.21)	LEAST	(.09)	(.05)	(.09)
LATERAL INCISOR				LATERAL INCISOR			
AVERAGE	6.4	4.4	6.0	AVERAGE	5.9	5.0	5.9
GREATEST	(.25)	(.17)	(.23)	GREATEST	(.23)	(.19)	(.23)
LEAST	(.17)	(.11)	(.17)	LEAST	(.09)	(.05)	(.09)
CUSPID				CUSPID			
AVERAGE	7.6	5.2	8.0	AVERAGE	6.9	7.0	6.9
GREATEST	(.29)	(.20)	(.31)	GREATEST	(.27)	(.27)	(.27)
LEAST	(.20)	(.15)	(.27)	LEAST	(.19)	(.11)	(.19)
FIRST BICUSPID				FIRST BICUSPID			
AVERAGE	7.2	4.9	9.1	AVERAGE	6.9	4.7	7.7
GREATEST	(.28)	(.19)	(.35)	GREATEST	(.27)	(.18)	(.30)
LEAST	(.19)	(.13)	(.27)	LEAST	(.19)	(.11)	(.27)
SECOND BICUSPID				SECOND BICUSPID			
AVERAGE	6.8	5.3	8.8	AVERAGE	7.1	8.0	8.0
GREATEST	(.26)	(.20)	(.34)	GREATEST	(.28)	(.31)	(.31)
LEAST	(.19)	(.13)	(.27)	LEAST	(.20)	(.15)	(.27)
FIRST MOLAR				FIRST MOLAR			
AVERAGE	10.7	7.5	11.9	AVERAGE	11.2	8.5	10.3
GREATEST	(.42)	(.29)	(.48)	GREATEST	(.44)	(.33)	(.40)
LEAST	(.29)	(.20)	(.35)	LEAST	(.37)	(.27)	(.33)
SECOND MOLAR				SECOND MOLAR			
AVERAGE	9.2	6.7	11.5	AVERAGE	10.7	8.1	10.1
GREATEST	(.36)	(.26)	(.45)	GREATEST	(.42)	(.31)	(.39)
LEAST	(.26)	(.19)	(.35)	LEAST	(.33)	(.23)	(.31)
THIRD MOLAR				THIRD MOLAR			
AVERAGE	8.8	6.1	10.6	AVERAGE	10.7	8.3	9.6
GREATEST	(.35)	(.23)	(.41)	GREATEST	(.42)	(.32)	(.38)
LEAST	(.23)	(.16)	(.33)	LEAST	(.33)	(.23)	(.33)

THIS CHART AFTER G. V. BLACK SHOWS THE AMOUNT OF TOOTH STRUCTURE REMOVED WHEN USING VARIOUS SIZES OF CHAYES ATTACHMENTS AND DEMONSTRATES BETTER THAN MANY WORDS THAT ONE NEED FEAR NO ILL EFFECTS ON THE PULP OF THE TOOTH IN USING THESE ATTACHMENTS. THIS IS A VERY COMPLETE CHART OF THE VARIOUS SIZES OF HUMAN TEETH AND MAY BE USED BY THE STUDENT AS A CARVING GUIDE IN HIS WORK OF ANATOMICAL CARVING OF TEETH.



THIS CHART SHOWS A NUMBER OF CAVITIES PREPARED IN DIFFERENT TEETH TAKING INTO CONSIDERATION ALL THE ESSENTIAL STEPS THAT MUST BE ACCOUNTED FOR IN PROVIDING PROPERLY FORMED CAVITIES FOR INLAYS WHICH ARE TO CARRY ATTACHMENTS OR TO RESTORE TOOTH STRUCTURE WHICH HAS BROKEN DOWN. THE INLAYS FOR THESE CAVITIES ARE SHOWN BELOW.

ALSO SHOWS A PROPERLY PREPARED ROOT FOR THE RECEPTION OF A CAST BASE AS WELL AS THE BASE ITSELF.

THE EXAMINATION AND ACCEPTANCE OF A PATIENT

Every patient presents a new problem which must be carefully studied, analyzed and synthetized. Each case requires a plan, a starting point and a destination.

Most of us are too ready to render haphazard opinions and therefore give our patients an impression of superficiality and irresponsibility. While the problems, all problems, may be approached from many diverse angles or avenues they must nevertheless be carefully studied with a view of determining just what the correct procedure would be.

Three things are absolutely essential in order to enable us to study a case requiring a restoration.

First: Study models made from plaster impressions, these models must be as perfect as we can make them and should disclose the exact macroscopic condition of the remaining teeth as well as the structure surrounding them.

Second: A set of acceptable radiograms, of all the teeth disclosing the condition of the alveolar structure and the enamel surfaces of all the teeth. Incipient caries as manifest by beginning decalcification of the enamel may be discovered by the application of the X-ray.

Third: A complete digital examination of the oral structure and a physical examination of the patient as well as his or her history from childhood to date will be of the greatest help in determining our course of action.

With these three things in our possession we can study the problem and draft our plan to present to the patient at the next appointment, which should take place at some future time, giving us sufficient opportunity for studying the case.

STEPS IN TECHNIQUE FOR CONSTRUCTION OF A CHAYES MOVABLE-REMOVABLE BRIDGE

FIGURE 1

A study model of the case for which we are to construct a bridge. We note that the condition of the remaining teeth is quite normal, the gingiva is in a comparatively healthy condition, there were no pockets around any of the teeth, the latter have not suffered from attrition, the occlusion is normal or fairly so and we conclude that the loss of the two teeth on the right side have been caused by poor dental service rather than any congenital or constitutional inferiority of the patient.

It is our duty to so complete this restoration that the patient's health will be enhanced and the vitality of the teeth which are to act as piers for the restoration will not be impaired or endangered.



FIGURE 1

FIGURE 2

By means of the parallelometer we measure the distance between the distal surface of the bicuspid and the mesial surface of the second molar. This distance is now transferred to a sheet of paper. We now add .102 of an inch to this distance, this is equal to No. 10 gauge (Brown and Sharpe).

This will give us the amount of space we must produce between mesio-occlusal line angle of the second molar and disto-occlusal line angle of the second bicuspid.

The linear dimension of the parallelometer is changed to allow for the increase of .102 and it is locked in its changed position.

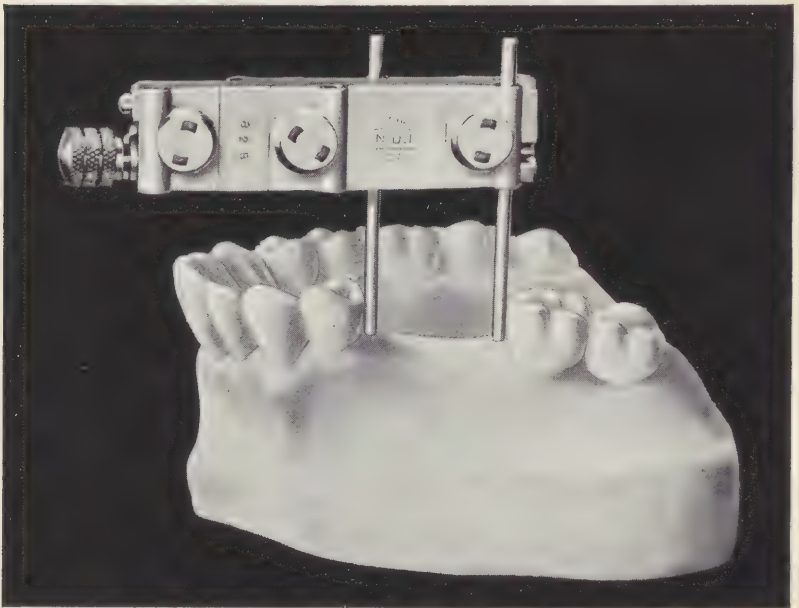


FIGURE 2

FIGURE 3

The alignment posts now replace the measuring posts and this distance is transferred to the parallel-drill.

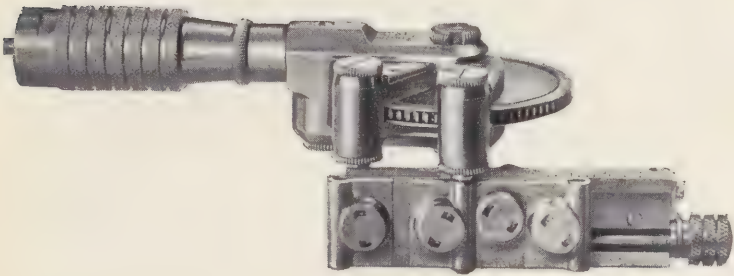


FIGURE 3

This instrument may be used on one tooth at the time by simply swinging one of the drill-heads out of the way.

It will be found very useful in the preparation of cavities in sensitive teeth, since it is so perfectly made that it is almost vibrationless.

FIGURE 4

One cone-shaped and one inverted cone-shaped stone are now inserted into the respective drill heads and space is provided to house thickness of inlays, jackets, and reinforcing plates within the circumference of the teeth as illustrated in Figure 4.

It is of course necessary to finish the preparation of the respective cavities by using suitable stones and employing one drill head at a time.

The above application of the parallelodrill is possible only in normal cases, in abnormal cases the least that can be done with this parallelodrill is to establish a definite starting point on both abutment teeth for the cavities required for the inlays.

The author begs leave to refer the earnest student to his work on the cast gold inlay, Mosby & Company, St. Louis, for a complete elucidation of the principles of cavity preparation.

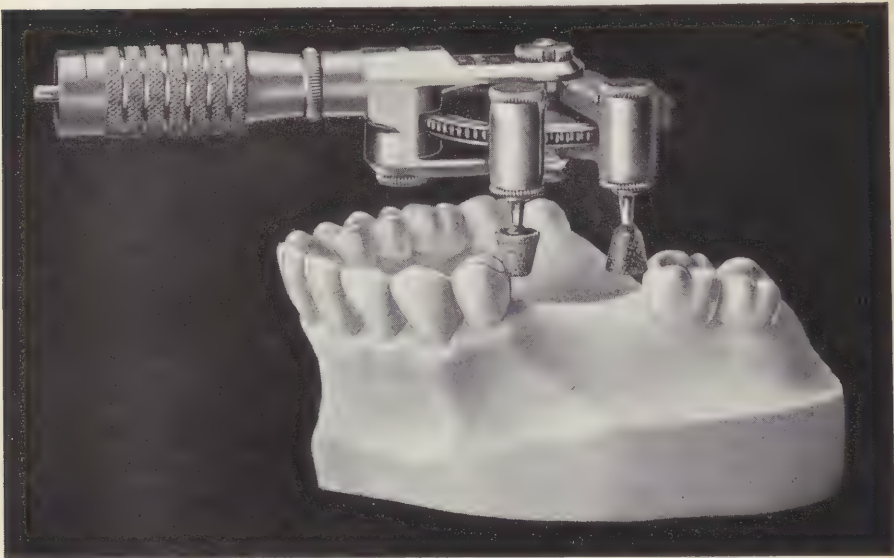


FIGURE 4

FIGURE 5

Illustrates the completed cavities in the pier teeth. These cavo-surfaces have been duplicated in fusible metal in the following manner.

After the inlays have been cast, cleansed, tried in the mouth and found satisfactory, they are removed from the cavities and a cone of inlay wax is softened to the correct plasticity, the inlays coated with graphite are then forced into the inlay wax so that a perfect seat is produced for each inlay, the wax is trimmed to a thin cone shape terminating in a ball and the margins of the wax seat are made flush with the margin of the gold inlays; these wax seats are chilled, and with the inlays are imbedded in a plaster mold, the ball terminal of the cone will, when the wax has been steamed out provide a funnel to conveniently receive the fusible metal.

Upon the breaking of the mold the ball end is removed, the inlay is separated from its seat, thrown into nitric acid to cleanse it, the metal seats are fin-



FIGURE 5

ished, undercut on the root end and laid away to be subsequently used in the impression which carries the inlays for the abutment teeth.

Figure 5 shows these metallic seats as carried in the stone model.

FIGURE 6

Shows the model supposed to be the mouth with the wax patterns in the abutment teeth.

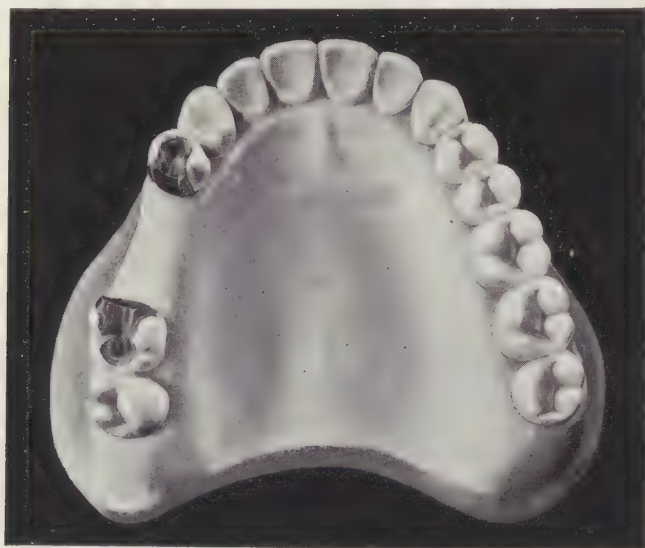


FIGURE 6

FIGURE 7

Shows the molar inlay in position on the metal seat, note space provided for bucco-lingual jacket.

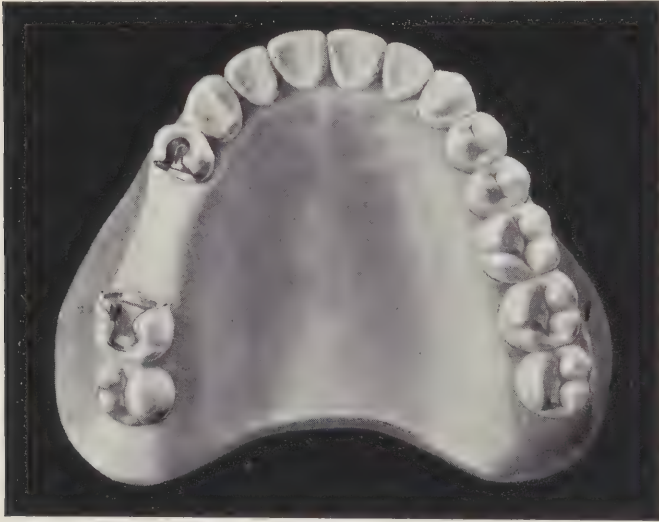


FIGURE 7

FIGURE 8

Wax inlay mounted on crucible former and gold cast alongside. Note definition of axial walls, bevels, and incline plane on occlusal cavo-surface.

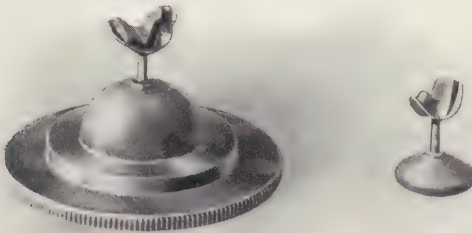


FIGURE 8

FIGURE 9

Shows the method of applying the parallelometer carrying the bucco-lingual mandrels, which carry the bucco-lingual jackets, which latter are waxed in their respective inlays. These bucco-lingual mandrels must be oiled so that the hard wax which attaches the jackets to the inlays will not stick to the mandrels. It will be noted here that the occlusal surface of both abutment teeth which carry their respective inlays are here seen covered with plaster-paris so that no chance of displacement occur. When these inlays have been waxed in and the sticky wax has hardened under the influence of cold water, the mandrels are released from the parallelometer, the latter is slipped off, the plaster is chipped off one of the abutment teeth, and the inlay and jacket are removed from the mandrel by the use of a flat instrument which is held directly against the mandrel, a piece of carbon corresponding to the size of the mandrel and snugly fitting the jacket is now

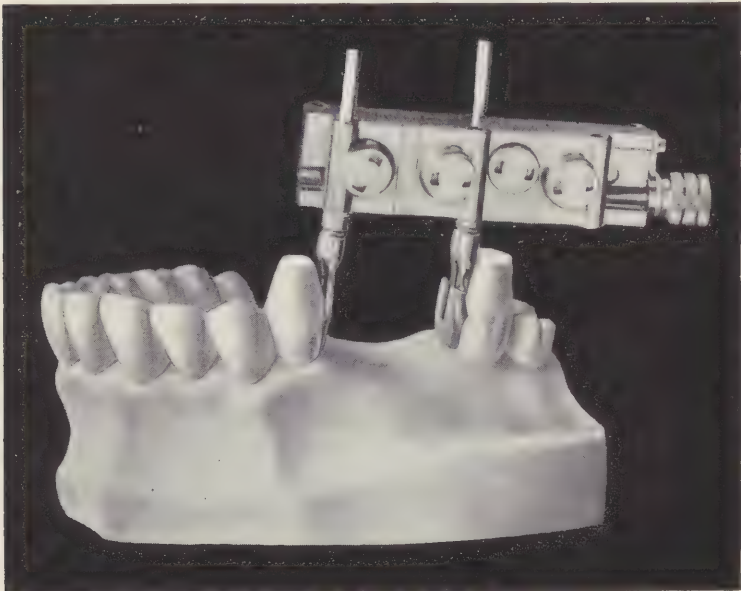


FIGURE 9

C. C. H. met. in. h.

anti-fluxed and inserted into the jacket, laying the carbon which now carries the jacket and inlay aside, a mix of investment is made and the inlay plus jacket, plus carbon is now invested, with the investment coming over the margins of the inlay and over the extreme end of the carbon as illustrated in Figure 10. When the investment has set, the wax is boiled out, the inlay and jacket are fluxed, the reinforcing plate is carefully placed over the jacket so that its slot corresponds to the slot in the jacket, the piece is carefully heated on the burner and with a little 22 karat solder, inlay, jacket, and reinforcing plate are joined into one piece. It must be understood that the cavo-surface of the inlay has also been fluxed.

FIGURE 10

Shows a fluxed inlay with the carbon in position on one side, in the center, the invested piece, and on the other side, the complete soldered inlay carrying the jacket and still carrying the carbon. After this piece has been soldered and cleansed in its acid bath and in its sodium bicarbonate bath it is brought down to form, replaced into the model, the occlusal surface again covered with plaster and the parallelometer is again applied to the two attachments, checking up the correctness or incorrectness of the operation as the case may be. If found correct the second attachment is handled in the same way, when both are replaced on the model and the parallelometer again used to check up the perfect parallelism. See Figure 11.

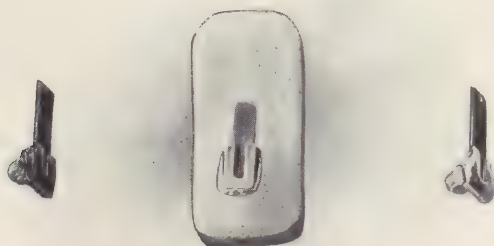


FIGURE 10

FIGURE 11

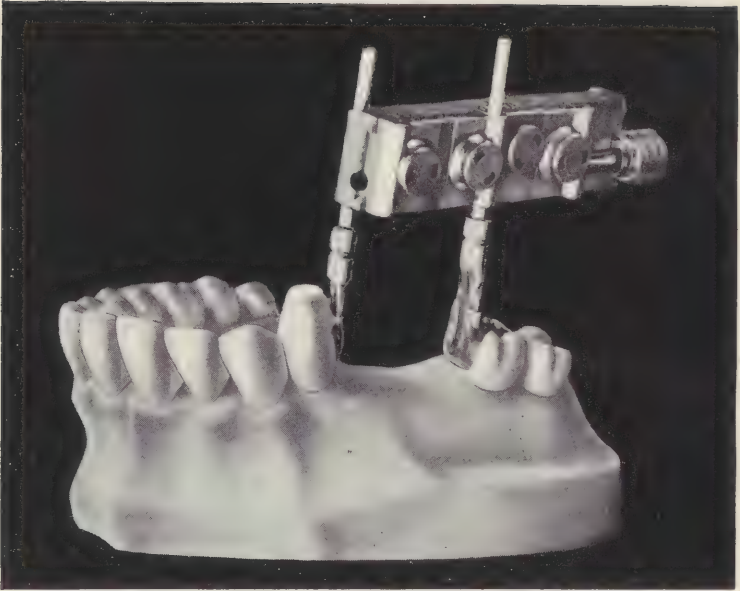


FIGURE 11

The parallelometer and the two bucco-lingual mandrels are here seen in position. One jacket has been soldered in, the molar attachment complete has been replaced and the bicuspid inlay, still covered with plaster, is receiving the jacket which has been waxed in. The mandrels are now carefully freed from the instrument, the plaster is carefully cut away and the bicuspid inlay and jacket are invested and joined as described.

FIGURE 12

Shows the two inlays in position on the model with the two attachments soldered in with their respective inlays and shows these inlays trimmed down to the required occlusal restoration.



FIGURE 12

The errors to guard against at this point of the technique is the possible displacement of either one or both of these inlays. In order to check up we use the parallelometer carrying the bucco-lingual mandrels, having left the instrument locked for this purpose.

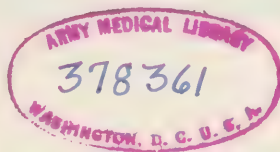


FIGURE 13

Shows the teeth for the case ground in and the saddle waxed up, also shows the truss arms which are to receive the cross arms of the male parts of the bucco-lingual attachments all waxed in. Note here the extension of the wings of the saddle and I beg leave to refer the student to the section on saddles so that he may elucidate for himself the purpose of these extensions. Care must be exercised in the grinding of these teeth. A true stone which is kept moist will enable one to do rapid, and accurate grinding without impairing the

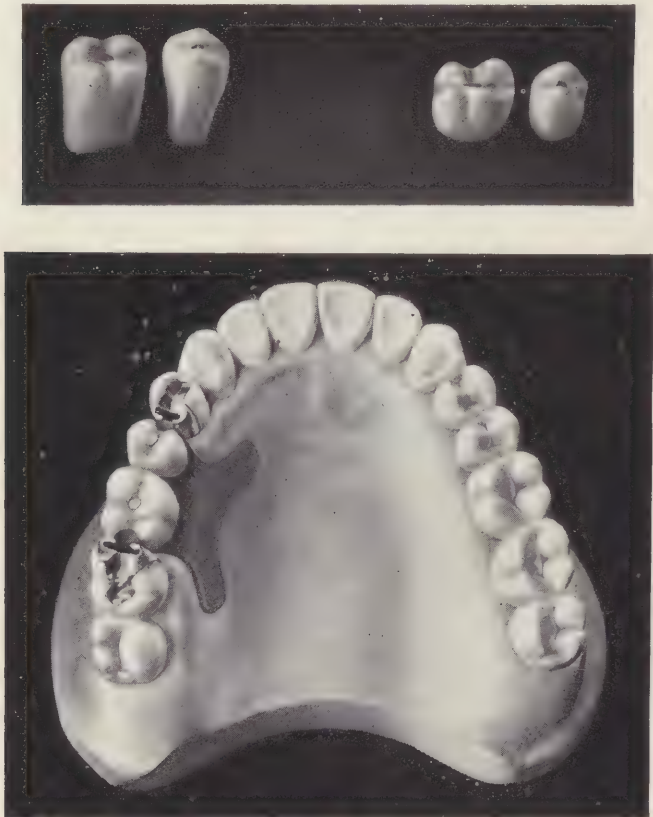


FIGURE 13

integrity of the porcelain body. A student should provide himself with two grades of grindstones. Medium and fine, using the medium one first, then the fine one, the ground area should then be polished with cuttle fish discs and oxide of tin in order to produce a smooth surface.

FIGURE 14

Shows the teeth removed from the saddle, sprue-wire in position ready for its first coat of investing material.



FIGURE 14.

FIGURE 15

Shows this saddle covered with its first coat of investing material, the sprue-wire free of investment for the entire length of its seat, which is to go into the crucible former. When this coat of investment has hardened, all of the refractory compound which may have gone into any of the undercuts on the model is carefully removed. The model is carefully tapped a few times against the bench and the saddle plus the investment may be lifted off the model by means of compressed air.



FIGURE 15

FIGURE 16

Shows the saddle removed, the sprue-wire inserted into the crucible former, the mass of investment has been thoroughly moistened so as to accept the second or final layer which by the way is also made to fill the flask. When the second mass of investment has been set, the crucible former has been removed, the sprue-wire is also removed by gently heating it in a small flame, then rotating it outward, the wax is carefully dissipated by heat, and the saddle is cast as illustrated in Figure 17 which shows the cast saddle resting on the model with the surplus button still in position.

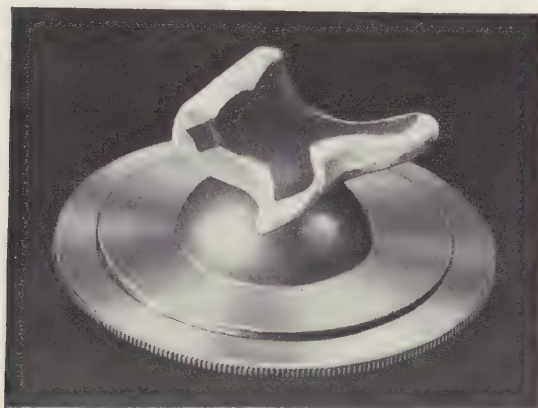


FIGURE 16

Note carefully the thickness of the first mass of investment which covers the wax table; there must be volume enough to provide strength and yet one must leave enough room for the second mass so that we may have sufficient resistance to internal pressure when casting.

FIGURE 17

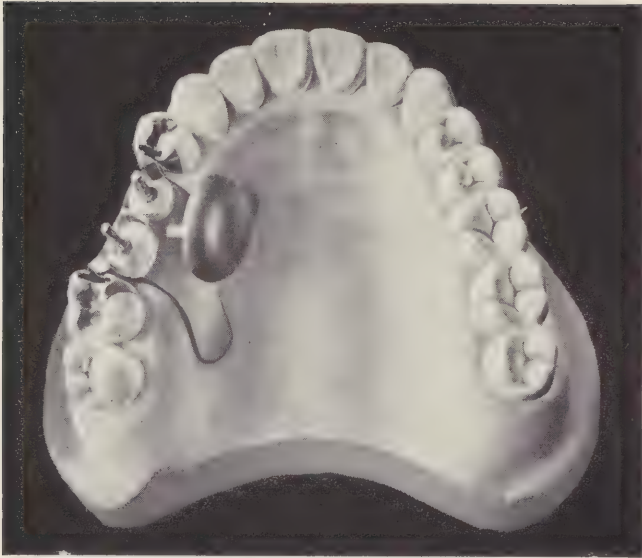


FIGURE 17

FIGURE 18

Shows the saddle with the surplus button removed, the trusses of the saddle slotted to receive the cross arm of the bucco-lingual attachments. Here great care must be exercised not to make the opening for the cross arm too large because it would necessitate the filling up of any space left between cross arm and slot with foil and then with solder. If we might so slot our trusses that the slots will be just large enough to take the cross arm of the attachment without binding against any part of the truss and therefore without interfering with the fit of the saddle on the model, then we would be compelled to use but little solder and this always is an advantage. It is well to note here that while the inlays carrying the jackets have been ground and shaped to occlusion, the male portions of the attach-

ments are left longer than the required occlusal dimension so that we may embody the extruding part of the male attachment in plaster after the cross arm of this attachment has been fitted to the slotted truss. The plaster is also made to cover part of the saddle so when the latter is hard we may remove saddle and one attachment as illustrated in Figures 18 and 19. This saddle and attachment are now carefully anti-fluxed at the cross arm and truss junction, a piece of slate is shaped like a fork sufficiently thinned down so that it will slide in between attachment and truss straddling the cross arm. This piece of slate is anti-fluxed, dipped in a very thin mix of investment and saddle plus attachment, plus slate are now invested in a mix of refractory compound. When this has hardened the plaster is carefully chipped off the top of the attachment and away from the truss of the saddle and the top of the attachment is covered with a second mix of refractory compound. When this second mix has become sufficiently hard the whole piece is washed in boiling water,

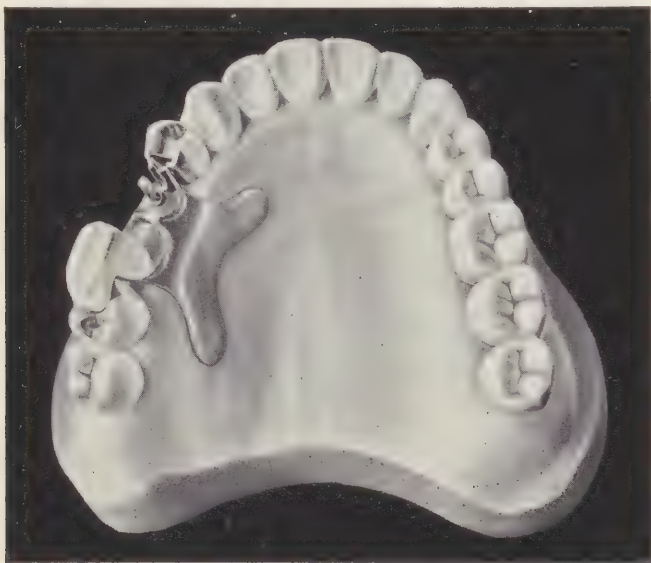


FIGURE 18

fluxed, heated and with a small piece of 22 karat solder the cross arm of the attachment is joined to the truss arm as illustrated in Figures 20 and 21. This procedure is gone through again for the purpose of soldering the second attachment and when both have been joined to the saddle, the piece of work is cleansed of its refractory compound, boiled in acid, then in sodium bicarbonate, both surplus ends of the cross arm are now carefully trimmed away with a carborundum disc and the teeth are again fitted into their respective seats. This bridge must go to place on the model without exercising any stress whatever on either of the abutments, the occlusal length of the attachments is marked out with a sharp instrument and the male portions of the attachments may now be ground down to the normal occlusal restoration.

FIGURE 19



FIGURE 19

FIGURE 20

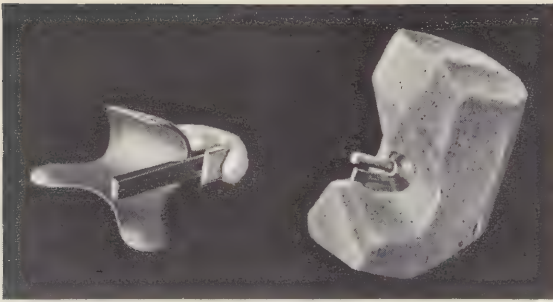


FIGURE 20

Note position of slate fork in this figure and relation of arm of attachment to truss of saddle.

FIGURE 21



FIGURE 21

Note the cast saddle in the trusses slotted receiving cross arms of the attachments.

FIGURE 22
Shows completed bridge.

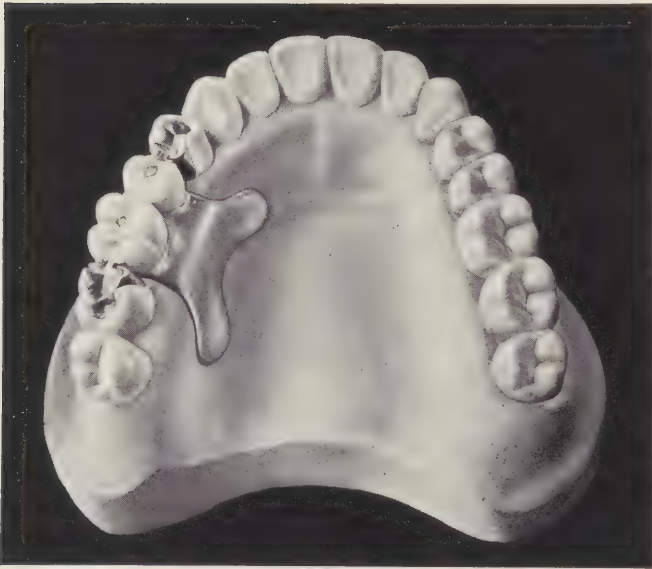


FIGURE 22

Note distance of saddle from the abutment teeth. If the abutment teeth are vital then the distance of the saddle from them must be at least as great as the length of the crown. The saddle may be nearer to them if the abutment teeth are pulpless.

FIGURE 25

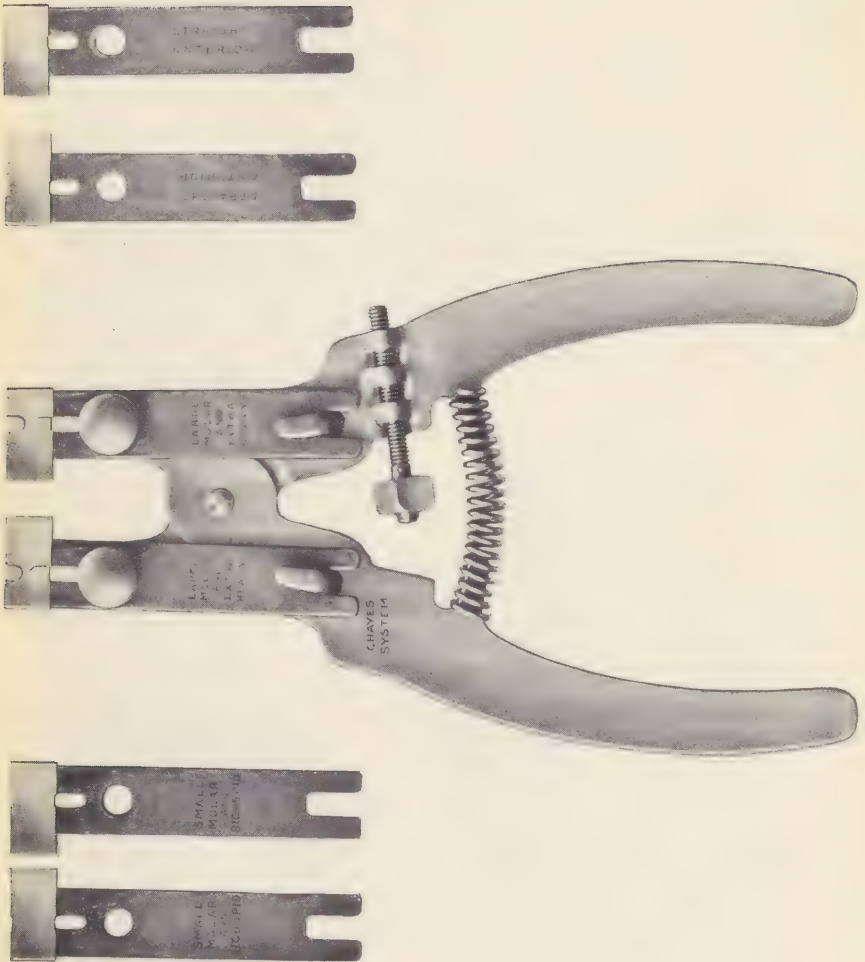


FIGURE 25

ILLUSTRATION OF AN APPLIANCE ESPECIALLY CONSTRUCTED FOR OPENING CHAVES ATTACHMENTS TO A DEFINITE AMOUNT IN ORDER TO TIGHTEN THE ATTACHMENTS WHICH MAY BECOME LOOSE.

FIGURE 26

Shows the application of this appliance and a careful examination will disclose the method of the use of this instrument. The instrument is provided with a set-screw for definitely limiting the movement of the jaws. One complete turn of the square head of this set-screw will provide for the opening of an attachment to one-half of one thousandth. Before using it on the attachment it should be set to the width of the size of the attachment which the operator desires to spread.

One side of the attachment is opened at one time. The bridge is turned around to enable the operator to open the other side.



FIGURE 26

And finally the following suggestions are recommended for the perusal of the student whenever he becomes doubtful of any step in his work.

IMPORTANT

1. Be sure of the positive seat of any inlay which is to be used as an abutment.
2. Be sure to use Alloy B for all inlays which are to carry jackets.
3. Be sure to carefully make your seats for all abutments and be sure that these seats are correctly placed into the inlays after the impression is taken.
4. Be sure that the inlays are in position and engage the cavity properly before you take the impression.
5. Be sure to apply the Adrenalin Chloride for two minutes to the edentulous space before taking the impression.
6. Include at least half of the mouth when taking the impression for a simple bridge.
7. Take your bite carefully before taking the impression.
8. Take a separate impression of the opposing teeth and pack the occlusal surfaces of these teeth in copper or silver amalgam.
9. Pack the impression which carries the inlays and seats in them in artificial stone.
10. Trim your models to nice lines and have them of an even thickness.
11. Use your sizing tools after soldering jackets into inlays, and always vaseline all sizing instruments.
12. Be sure to have the jacket so placed in your abutment that the cross arm of the attachment is as nearly over the center of the ridge as possible.
13. Don't ever file or disc any of the attachments to get them to place.
14. Don't make the set-screw in the distal extension too deep, because you will defeat its function. The seat should be cone-shaped and not cylindrical in shape, and the end of the set-screw must be cone-shaped.

15. Don't forget your slate fork when investing a saddle and attachment to it. When making a fork, first heat slate pencil to a cherry red, allow it to cool, and then form to the desired shape.

16. Don't ever shorten the distal extension.

17. Don't use too much solder; cut your slot in the wing of the saddle so that but little solder will be required to join the attachment to it.

18. Don't polish your saddle on the palatal or mandibular surface except with soap and water and a brush and whiting.

19. Don't bring your saddle too near the roots of the teeth, for you will overstimulate the area around them.

20. Don't make the saddle too small in the upper nor too large in the lower.

21. Don't overheat the attachments in soldering, concentrate your heat on the cross arm of the attachment and the wing of the saddle rather than on the friction plate of the attachment.

22. Don't forget to cover the occlusal surfaces of the teeth which hold the inlays with plaster when paralleling the abutments.

23. Don't forget to place reinforcing plates carefully upon the jackets before soldering.

24. Don't use an anterior attachment in conjunction with a bucco-lingual.

25. Don't use an anterior attachment distally to the mesial surface of the cuspid.

26. Don't use split pins except in very short bites; not in posterior teeth, and absolutely never in lower centrals, laterals and upper laterals.

27. Don't forget to look carefully to the occlusion of the case before you allow it to leave your hands.

The cuts within this book make clear the construction of a unilateral compound bridge, employing two bucco-lingual attachments for sustaining the same in position. The definitions given in this book for other than unilateral compound bridges have been put in merely to enlighten the student, and the construction of them has not been described, nor have they been illustrated. It must be manifest to the student that such work would have meant a volume much larger in scope than contemplated by the author at the present time. It is sincerely hoped that the careful perusal and study of this volume will stimulate the student to take this work up in a serious way, so that within a given period of time he may perfect himself in the technique of the bridge illustrated in such a way as will cause him to seek further knowledge in regard to the construction of the other types of bridges.

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